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# Some Observations on the Hatinh langur, *Trachypithecus laotum hatinhensis* (Dao, 1970), in North Central Vietnam

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**Abstract:** The Hatinh langur, *Trachypithecus laotum hatinhensis* (Dao, 1970), is one of the many Vietnamese primates on the brink of extinction due to hunting and the loss of its natural habitat. This black langur, distinguished by its white moustache and sideburns that extend behind the ears to the nape, inhabits the limestone forests of the Central Annamite Mountains. The Hatinh langur is diurnal and largely arboreal, and group sizes are 15 or more. Here we report on surveys carried out in 1998–1999 in Quang Binh Province to determine the population status of *T. laotum hatinhensis*. In Vietnam, it occurs only in the limestone areas of five districts in the Quang Binh Province and Huong Hoa District of Quang Tri Province. The most important population is in the Phong Nha–Ke Bang National Park of Quang Binh Province; the only Vietnamese protected area where it is known to occur. Some observations on the species ecology and behavior are also included.
**Key Words:** Vietnam, Hatinh langur, limestone habitats, distribution, sleeping site, hunting, protected area

## Introduction

With more than 25 species and subspecies, Vietnam has the highest primate diversity of any country in Asia and the Indochina peninsula. Many are both endemic to Vietnam and endangered. Five of the world's most endangered primates are Vietnamese: the Cat Ba langur (*Trachypithecus poliocephalus*), Delacour's langur (*Trachypithecus delacouri*), the grey-shanked douc langur (*Pygathrix cinerea*), the Tonkin snub-nosed monkey (*Rhinopithecus avunculus*), and eastern black crested gibbon (*Nomascus nasutus*) (Mittermeier *et al*. 2006). The Hatinh langur, *Trachypithecus laotum hatinhensis* (Dao, 1970) is also extremely threatened, being classified as Endangered on the *2006 IUCN Red List of Threatened Species* (IUCN 2006). Once widespread in a number of north-central Vietnamese provinces, deforestation and hunting mean that its distribution is now severely limited, and until recently it was thought to remain in only a few districts of Quang Binh Province. In 2005, however, a new population was found in Huong Hoa District, Quang Tri Province (BirdLife International Vietnam Programme 2005). A report of its occurrence in Gia Lai, well to the south, is disputed (Lippold and Vu Ngoc Thanh 1995; Pham Nhat *et al*. 1996a, 1996b).

## Taxonomy and Distribution

The first specimen of this subspecies was collected at the hamlet of Cuc, in Ha Tinh Province (Bourret 1942), and a second was collected by Dao Van Tien, in February 1964, in Minh Hoa District of Quang Binh Province. Dao Van Tien (1970) named it *Presbytis francoisi hatinhensis*. Corbet and Hill (1992) listed it as a subspecies of *Semnopithecus francoisi*, and a number of authors have referred to it as *Trachypithecus francoisi hatinhensis* (e.g., Le Xuan Canh 1992; Dang Huy Huynh *et al*. 1994; Fooden 1996; Pham Nhat *et al.* 1996a, 1996b; Pham Nhat 2002). Although Brandon-Jones *et al.* (2004) listed it as *T. francoisi hatinhensis*, he earlier (1995) considered it to be a species separate from *francoisi*. Groves (2001, 2005) listed it as a full species based on the phylogenetic species concept (see also Workman and Covert 2005). Molecular genetic studies (Roos *et al*. 2001; Roos 2004) aligned *hatinhensis* with *laotum* (Thomas, 1911), placing it as a subspecies, and the name *T. laotum hatinhensis* has since been used by Nadler *et al*. (2003), which is followed here.

Le Hien Hao (1973) noted that the Hatinh langur occurred in the districts of Con Cuong, Tuong Duong of Nghe An Province, and Nhu Xuan District of Thanh Hoa. Over the next

20 years, there was almost no additional information on this subspecies in the wild. In 1992, Le Xuan Canh announced that photos of the Hatinh langur had been taken at a site adjacent to a market in Phong Nha, Bo Trach District of Quang Binh Province. In 1993, the Zoological Museum of Hanoi University collected a specimen, but without specific information on its origin. At the same time, the Forestry University of Vietnam collected a skin in Minh Hoa District of Quang Binh Province. We also collected some specimens at Dai A, Phong Nha, in 1999 (currently preserved at The Zoological Museum of Hanoi National University). Surveys by Pham Nhat *et al*. (1996a, 1996b) indicated that the hamlet of Cuc, Tuyen Hoa District in Quang Binh (the locality where Bourret [1942] collected the species) was the northernmost locality, but that today it is probably extinct there as the remaining limestone forest is severely degraded. There may also be a small population of 20–30 animals in the Khe Net forest, Tuyen Hoa District, but this has yet to be confirmed (Nadler *et al*. 2003).

Lippold and Vu Ngoc Thanh (1995) recorded the Hatinh langur in Con Cha Rang Nature Reserve in Gia Lai Province (14º33′N, 108º35′E). This locality, well to the south of the recognized range, was discussed by Pham Nhat *et al*. (1996a, 1996b) and Nadler *et al*. (2003). Pham Nhat *et al.* (1996a) indicated that its presence there is questionable—it is well to the south of the sites they surveyed—and if the Hatinh langur does survive there it is likely to be a very small relict population. Nadler *et al.* (2003) concluded that the presence of the Hatinh langur in the Tay Nguyen Plateau would be a major extension of its range, and needs further investigation. Vu Ngoc Thanh himself (pers. comm. 2006) believes that it was a mistaken record.

It appears that in the recent past the distribution of this subspecies ranged broadly from Nghe An to Quang Binh (Le Hien Hao 1973). Surveys in the central region of Vietnam carried out since 1998 by a number of scientists of our organization have shown that the Hatinh langur is now restricted to Quang Binh (districts of Minh Hoa, Bo Trach, Tuyen Hoa, Le Thuy, and Quanh Ninh), with the exception of the newly discovered population in Quang Tri Province. From the evidence currently available it would seem that the main stronghold of this population is in the districts of Minh Hoa and Bo Trach, where a vast primary forest exists in limestone ranges, particularly in the Phong Nha–Ke Bang National Park (Nguyen Xuan Dang *et al*. 1998; Nguyen Manh Ha 1999, 2004; Timmins *et al*. 1999).

In total, 16 groups were recorded by our team in Phong Nha in 1998 and 1999. A group was observed at Kim Lu, Tuyen Hoa, and two others, with unknown numbers of individuals, were seen at Cha Tum (Dan Hoa, Minh Hoa) and at Khe Dan (Kim Thuy, Le Thuy) in 2003. In total, 19 groups have been observed in four different districts of Quang Binh Province (Table 1). Additional recent surveys conducted by other researchers in Thanh Hoa, Nghe An, and Ha Tinh provinces failed to find evidence of Hatinh langur, and research conducted by us in 2003 in Quang Tri (Dakrong District), Ha Tinh (Huong Son District), and Nghe An provinces (Pu Huong Nature Reserve and Pu Hoat proposed nature reserve) also provided no evidence of their presence. We conclude that, with the information we have to date, in Vietnam the Hatinh langurs are primarily restricted to Quang Binh Province, with a small population in at least one further site in Quang Tri Province.

**Table 1.** List of Hatinh langur records and locations in Quang Binh Province, Vietnam.

| Group number | Location (Quang Binh province) | Number of individuals |
|---|---|---|
| 1 | Khe Cha Tum (Dan Hoa, Minh Hoa district) | >07 |
| 2 | Kim Lu (Tuyen Hoa District) | 30 |
| 3 | Khe Dan (Le Thuy District) | |
| 4 | Thung Tre (Phong Nha-Ke Bang National Park) | 3 |
| 5 | Thung Tre (Phong Nha-Ke Bang) | 7 |
| 6 | Thung Nhang (Phong Nha-Ke Bang) | 12 |
| 7 | Thung Nhang (Phong Nha-Ke Bang) | 15 |
| 8 | Tro Muong (Phong Nha-Ke Bang) | 2 |
| 9 | Tro Muong (Phong Nha-Ke Bang) | 8 |
| 10 | Tro Muong (Phong Nha-Ke Bang) | 5 |
| 11 | Thung Xuong (Phong Nha-Ke Bang) | 6 |
| 12 | Thung Lau (Phong Nha-Ke Bang) | 5 |
| 13 | Cop Ke (Phong Nha-Ke Bang) | 11 |
| 14 | Dai Cao (Phong Nha-Ke Bang) | 7 |
| 15 | Dai A (Phong Nha-Ke Bang) | 10 |
| 16 | Ba Giang (Phong Nha-Ke Bang) | 6 |
| 17 | Hang En (Phong Nha-Ke Bang) | 4 |
| 18 | Hang En (Phong Nha-Ke Bang) | 5 |
| 19 | Km28 (Phong Nha-Ke Bang) | 3 |

Nadler *et al.* (2003) reported that Hatinh langurs also occur in the west of Khammouan Province of Lao People's Democratic Republic. This is quite reasonable because Phong Nha–Ke Bang shares the same limestone range with Hin Namon of Laos.

## Morphological Characteristics

Locally, the Hatinh langur is known as the long-tailed gibbon or black gibbon. They are large monkeys weighing between 6 kg and 9 kg, and differ from the otherwise similar Francois' langur in having the white cheek stripe extend behind the ear onto the nape. Other differences noted by Nadler *et al.* (2003, p. 47) include "the whorls on the head, the shape of the crest, and the white moustache connecting to the white cheek stripes." Head/body lengths, tail lengths, and weights are shown in Table 2. Newborn infants have yellow fur, and begin turning black after two weeks. The infant is almost entirely black at three months.

## Habitat

As recognized by a number of authors, these monkeys generally inhabit limestone forests (Osgood 1932; Dao Van Tien 1989; Pham Nhat 2002; Nadler *et al*. 2003) and our research since 1998 has corroborated this finding. The Hatinh langur preferentially inhabits areas with dense forest cover, but they also forage and move about in more open areas.

**Table 2.** Morphological characteristics of the Hatinh langur, *Trachypithecus laotum hatinhensis*[1].

| | | Average | n | Source |
|---|---|---|---|---|
| **Head/body length (mm)** | | | | |
| Male | 560–590 | 575 | 2 | EPRC[2] |
| | 665 | | 1 | Brandon-Jones (1995) |
| Female | 540–570 | 556 | 3 | EPRC[2] |
| | 500 | | 1 | Brandon-Jones (1995) |
| **Tail length (mm)** | | | | |
| Male | 820–870 | 845 | 2 | EPRC[2] |
| | 810 | | 1 | Brandon-Jones (1995) |
| Female | 780–900 | 817 | 3 | EPRC[2] |
| | 870 | | 1 | Brandon-Jones (1995) |
| **Weight (kg)** | | | | |
| Male | 8.2–8.7 | 8.45 | 2 | EPRC[2] |
| | 8.0 | | 1 | Brandon-Jones (1995) |
| Female | 6.4–8.0 | 7.2 | 4 | EPRC[2] |

[1]Source: Nadler *et al*. (2003)
[2]EPRC = Endangered Primate Rescue Center, Cuc Phuong National Park

Dense forests cover approximately 90% of their range in the limestone hills of Phong Nha, Kim Lu, and Dan Hoa of Quang Binh Province. It is when they forage in open environments that it is possible to observe them. It is quite possible, however, that their current preference for these limestone forests is now largely an artefact of the pressures from widespread habitat loss and fragmentation and hunting (Li and Rogers 2005). The term "limestone langurs" was coined, it would seem, during an international symposium on the conservation of Vietnamese primates held at the Cuc Phuong National Park, 18–21 November 2003. Groves (2004) pointed out that this is a useful and ecologically descriptive collective for seven species of langur that are today associated with limestone forests but does not, it would seem, reflect a coevolution of these primates with these particular forests (Li and Rogers 2005).

## Breeding and Group Structure

Hatinh langurs have been observed in a number of different social group structures. Group size generally ranges from two to 15 individuals (Nguyen Manh Ha 1999; Pham Nhat 2002), but groups of up to 30 individuals have been observed in Kim Lu, Tuyen Hoa of Quang Binh Province. The group structure normally includes one male and three or four females and their immature offspring (Nguyen Manh Ha 1999), but this may vary in relation to hunting pressure and the quality of the habitat. Hunting severely affects the social structure and number of individuals in the groups. In 1999 and 2000, for instance, during our survey in Phong Nha, local hunters reported that they had gunned down at least three entire groups of Hatinh langurs in Co Khu, Dai Cao, Hung Xuong of Phong Nha, and most of the Hatinh langur groups in Phong Nha and Dan Hoa were diminished due to illegal hunting in the area (Nguyen Manh Ha 1999). Other than the loss that hunted individuals represent to the population, skewed sex ratios and isolation from other groups caused by hunting can have a serious negative impact on population viability. Isolation caused by habitat fragmentation is also a serious concern, presumably affecting group composition due to lack of opportunities for dispersing individuals.

Females give birth to single offspring (Pham Nhat 2002) and breed all year round. Research has shown that births occur at different times of the year; for instance, at Phong Nha they have been recorded in July 1998, February and March 1999, July 2002, August 2003; at Dan Hoa in April 2004; and in Kim Lu in May and June 2004. Pham Nhat (2002) recorded births in August in the Endangered Primate Rescue Center, Cuc Phuong, and in November (probably in Phong Nha). There is a peak in births in the summer and spring, however, when food is abundant, the climate is warmer, and there is less rainfall (Nguyen Manh Ha 1999; Pham Nhat 2002).

## Sleeping Sites and Other Behaviors

The sleeping sites are one of the most interesting features of this langur's behavior because of their location. They use the same sleeping sites for many years if there is no disturbance or hunting. Some groups in Tro Muong area, Phong Nha National Park, for example, have not changed their sleeping sites since 1998. They are usually in small caves and crevices in limestone escarpments or even in large limestone caves. The caves provide protection from the rain during the wet season and the cold north wind in the winter, as well as from their natural predators. A hunter in Phong Nha informed us that he shot a yellow-throated marten (*Martes flavigula*) in the Dai Cao area while it was eating a female Hatinh langur that it had presumably killed (this Hatinh langur is preserved in The Zoological Museum of Hanoi National University).

Hatinh langurs seem to prefer cliffs facing west or southwest over those oriented in other directions (Tro Muong, Hang En, Kim Lu, Dan Hoa), a feature that may relate to these cliffs being the warmest location in the late afternoon. The height of sleeping caves on the cliffs is generally about 20 m from the base, but can be up to 50 m. The most remarkable aspect of a typical sleeping cave is the orange or dark-yellow stains below the entrances, the result of urine and the feces that the langurs excrete at night (Fig. 1). The distinctive stain and the strong smell associated with the entrances to these caves and crevices indicate their constant and frequent use by the langurs. Wang *et al.* (2005) noted that the stains on limestone escarpment sleeping sites of *Trachypithecus leucocephalus* became darker after a sleeping site was abandoned.. They noted that if stains were wet then the site was in use, as these dry up after about only one month. Wang *et al*. (2005) found that it was easy to recognize these sleeping sites even after some 10 years of abandonment. Unfortunately, these sleeping sites facilitate the illegal hunting of this species.

The time of leaving or arriving at sleeping sites is different for each langur group, but quite consistent for each group if there is no evidence of danger or unusual disturbance at the site. Although they usually return to their sleeping sites from 18:15 to 19:00, the time varies seasonally, and depends, for example, on the direction the caves face and their elevation,

**Figure 1.** A limestone escarpment, sleeping site of a group of Hatinh langur, *T. laotum hatinhensis*, at Phong Nha-Ke Bang National Park, Quang Binh Province. Photograph by Nguyen Manh Ha.

aspects that determine when the sun reaches or leaves the escarpment (Nguyen Manh Ha 1999).

Langurs often return to the vicinity of the sleeping site quite early, around 16:00, and rest and play in the area until entering the caves at dusk. Observation conditions are excellent at this time, and it is then that it is possible to perceive social interactions and to identify the leader of the group. The dominant animal is often aggressive toward juvenile males, and is also the one to initiate movement toward the sleeping site. When he makes a "huut ... huut" sound, repeating it two or three times, the langur group begins to move into their sleeping caves and crevices. When moving down the cliff, the group always travels in single file along a crevice in the rock face or along a tree root. The "huut ... huut" vocalization is also used as an alarm call when a langur sees something unusual or recognizes danger.

Members of the social groups do not share a single sleeping cave, rather the adults separate off; sometimes two animals share a small cave, and on only one occasion did we observe three sleeping together (Hang En of Phong Nha–Ke Bang National Park). This behavior was also confirmed by a local hunter. Individual sleeping sites may be a hole or crevice in the rock or a small cave on the limestone cliffs or on the roof of a big limestone cave (as, for instance, at Hang En and Dai A).

Langurs leave their sleeping caves early; at dawn. It seems that the departure time depends on daylight, because in the summer they leave earlier than in the winter, and the cold weather in the winter may be another factor (Hatinh groups in Tro Muong, for instance). The dominant male is always the one to lead the way when they leave their sleeping caves, and when they return in the evening. This behavior can be observed regularly at the same place with the same groups if the langurs do not perceive any danger.

As with all catarrhines, the Hatinh langur is diurnal and feeds during the day. However, it is difficult to make close-up observations of the langurs when they are traveling because they are always in the forest canopy of the limestone slopes, the terrain is difficult, and they are very vigilant as to the presence of humans. It is quite difficult, as such, to approach them to observe their behaviors, especially their feeding. As with other Vietnamese monkeys such as doucs (*Pygathrix*) and Tonkin snub-nose monkeys (*Rhinopithecus avunculus*), there is as little or no available information on feeding and ranging of Hatinh langurs in the wild.

## Population Numbers

We have insufficient data for any accurate estimation of the size of the remaining populations of the Hatinh langur. Twenty groups with 152 individuals were recorded during our surveys. Sixteen of these groups were in Phong Nha. Based on our survey, the most important population is distributed along the Phong Nha–Ke Bang limestone range in Phong Nha–Ke Bang National Park. This national park is currently the only protected area for this langur. The Phong Nha Nature Reserve is 41,132 ha; 24,861 ha of which are limestone forest (Pham Nhat *et al*. 1996a). Other smaller populations can be found in some limestone areas in Minh Hoa, Tuyen Hoa, Le Thuy, and Quang Ninh districts, all of which are isolated.

## Threats to the Survival of Hatinh Langurs

The Hatinh langur is one of the most threatened primates in Vietnam due to its continuously declining population. It is listed as Endangered in the Red Data Book of Vietnam and likewise Endangered on the 2006 IUCN Red List (IUCN 2006). As is the case for all primates in Vietnam, the Hatinh langur faces two main threats.

In the districts of Minh Hoa, Bo Trach, and Tuyen Hoa in Quang Binh Province, the Hatinh langur is targeted by hunters for wildlife trade (Fig. 2). The langur and its parts are being traded and used for traditional medicine known as balm in English or "Cao Khi" in Vietnamese. There is no information, however, concerning the international trade or trade in live individuals. Hunting remains the most serious threat to this langur. Despite being illegal throughout its range, this activity continues because hunters consider it an easy prey due to

**Figure 2.** Male and female (with infant) Hatinh langurs, *T. laotum hatinhensis*, were confiscated near the Phong Nha Nature Reserve from a market in the Phong Nha commune, Quang Binh Province in 1997. Photograph by Nguyen Manh Ha.

its habit of returning to easily identifiable sleeping sites each night.

Habitat loss is the second main threat. This langur is heavily dependent on limestone forests, which are in continuous decline. They continue to be cut, and are becoming increasingly fragmented. Forest clearance and new roads in the limestone landscape make permanent barriers, and further isolate the remaining langur populations. This isolation makes dispersal difficult or impossible, and undoubtedly increases the mortality of dispersing males, and may well lead to inbreeding among the remaining langur groups.

## Conclusions

The Hatinh langur is endemic to the limestone landscapes of the Central Annamite Mountains. It is highly social, generally living in groups of 2–15 individuals, it is diurnal and largely arboreal; and the preferred habitat is the limestone forests of this region. In Vietnam, the langur occurs only in the limestone areas of five districts in Quang Binh province, along with the Huong Hoa district of Quang Tri Province. The wild population is declining due to hunting and the loss and fragmentation of their natural habitat. Suitable habitats are now restricted to limestone mountain forest in the two provinces, the most important population being located in Phong Nha–Ke Bang National Park; the only protected area where it is known to occur. There may also be a small population of 20–30 animals in the Khe Net forest, Tuyen Hoa District, but this has yet to be confirmed (Nadler *et al*. 2003).

## Recommendations

The Hatinh langur is one of the most threatened primates in Vietnam and appropriate measures and programs for its protection are urgently needed. We recommend the following:

- Strong measures need be taken to eliminate the illegal hunting of this langur and other wildlife in this region, and strict punishments need be applied to those participating in illegal hunting or trading not only for this langur and its parts but for all illegal wildlife trade activities.
- The Phong Nha–Ke Bang National Park has the most important remaining population of the Hatinh langur and is, besides, the only protected area where it occurs. The park should be increased in size to include limestone areas to its northwest (see also Pham Nhat *et al*. 1996a).
- Conservation education campaigns increasing the profile and stressing the value of Hatinh langurs and wildlife in general are urgently needed for the local communities and villages within their known range.
- Surveys are needed to map the remaining limestone forests of the region and to better understand the size and distribution of the remaining Hatinh langur populations in the wild.
- A detailed, long-term study on the demography, ecology, and behavior of the Hatinh langur should be set up. This should also address the extent and dynamics of the threats they face, which will be crucial for implementing a long-term conservation strategy.

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